

PATENT SPECIFICATION (11)

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(54) A VACUUM DEPOSITION SYSTEM

(71) I, KENNETH BRIGGS CRASWELL, a British subject, of 26 Ham Close, Charlton Kings, Cheltenham, Gloucestershire, formerly of 48 St. Michael's Road, Woodlands, Cheltenham, Gloucestershire, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a vacuum deposition system.

According to this invention, there is provided a vacuum deposition system comprising a vessel which comprises first and second vessel segments, a major portion of each of which is part of a sphere, the segments being hinged together whereby one may be pivoted away from the other to open the vessel, means for producing a vacuum in the vessel, a work-holder in the vessel, and heating means in the vessel for heating an evaporation source, the heating means not including the centres of curvature of the said portions.

In one example, each of the segments is mainly hemi-spherical, the segments providing a vessel which is substantially spherical.

In another example, the said portion of one of the segments has a greater radius of curvature than the said portion of the other segment, the said one of the segments is in a position mainly within the other segment to provide the vessel and the work-holder and the said heating means are in the other segment.

There could be a sealing ring between the two segments for sealing at the peripheries of the segments.

One of the segments could support the work-holder, the other of the segments supporting the heating means.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows, partly in section, a vacuum deposition system and

Figure 2 shows, also partly in section, part of an alternative form of vacuum deposition system.

Referring first to Figure 1, a vacuum

deposition system has a vacuum vessel comprising a first and second mainly hemi-spherical vessel segments 1 and 2 which provide a vessel in which can be provided a high vacuum, there being a high vacuum rubber sealing ring 3 between the segments 1 and 2 for providing a seal at the peripheries of the segments.

The segments 1 and 2 are hinged together by means of a hinge 4 whereby the segment 1 may be pivoted away from the segment 2 to open the vessel when the vacuum has been released.

Supported by the segment 1 is a work-holder 5 therein, this being mounted for rotation in use of the system; and supported by the segment 2, via conductor rods 6 (of which only one is shown), is an electrical filament 7 therein for heating an evaporation source in use of the system. Heating current is pass through the filament 7 in use of the system via conductors 8 and terminals 9. The filament 7 does not include the centres of curvature of the segments 1 and 2.

A pumping arrangement is mounted directly underneath the segment 2 for evacuating the vessel when the segments 1 and 2 have been closed together and withdrawing vapour after vacuum deposition has been effected on a work-piece held by the holder 5. The pumping arrangement comprises a rotary pump 11, a valve 12, a baffle valve 13, a cold trap 14, a valve 15 and a diffusion pump 16.

Referring now to Figure 2, in which items which are the same as items in Figure 1 have been designated with the same reference numerals as in Figure 1, a high vacuum vessel comprises a mainly hemi-spherical vessel segment 1 and a mainly part-spherical vessel segment 17, the former having a lower radius of curvature than the latter and the latter being in a position mainly within the former when they are closed together to provide a vessel as shown in Figure 2. Between the segments 1 and 17 is a high-vacuum rubber sealing ring 3 to provide a seal at their peripheries.

The segments 1 and 17 are hinged together by a hinge (not shown) like the hinge 4 in Figure 1 whereby the segment

1 may be pivoted away from the segment 17 to open the vessel.

The segment 1 supports a work-holder 5 therein, mounted for rotation in use of the system, and the segment 17 supports in the segment 1 a pair of electrical heating filaments (not shown), on respective sides of a pump arrangement underneath the segment 17. Each of the filaments is supported and fed with heating current in a manner like that shown in Figure 1 for the filament 7. Again, the filaments do not include the centres of curvature of the segments 1 and 17.

The pumping arrangement is mounted directly underneath the segment 17 and is identical to the pumping arrangement shown in Figure 1, only the baffle valve 13, the cold trap 14 and the diffusion pump 16 being shown.

In the example according to Figure 2 there is less volume to be pumped than in example according to Figure 1.

WHAT I CLAIM IS:—

1. A vacuum deposition system comprising a vessel which comprises first and second vessel segments, a major portion of each of which is part of a sphere, the segments being hinged together whereby one may be pivoted away from the other to open the vessel, means for producing a vacuum in the vessel, a work-holder in the vessel, and heating means in the vessel for heating an evaporation source, the heating means not including the centres of curvature of the said portions.

2. A system according to claim 1, where-

in each of the segments is mainly hemispherical, the segments providing a vessel which is substantially spherical.

3. A system according to claim 1 or 2, wherein the said heating means is in one of the segments and the work-holder is in the other of the segments.

4. A system according to claim 1, wherein the said portion of one of the segments has a greater radius of curvature than the said portion of the other segment, the said one of the segments is in a position mainly within the other segment to provide the vessel and the work-holder and the said heating means are in the other segment.

5. A system according to any preceding claim, wherein there is a sealing ring between the two segments for sealing at the peripheries of the segments.

6. A system according to any preceding claim, wherein one of the segments supports the work-holder and the other of the segments supports the said heating means.

7. A vacuum deposition system, substantially as herein described with reference to Figure 1 of the accompanying drawings.

8. A vacuum deposition system, substantially as herein described with reference to Figure 2 of the accompanying drawings.

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COMPLETE SPECIFICATION

2 SHEETS

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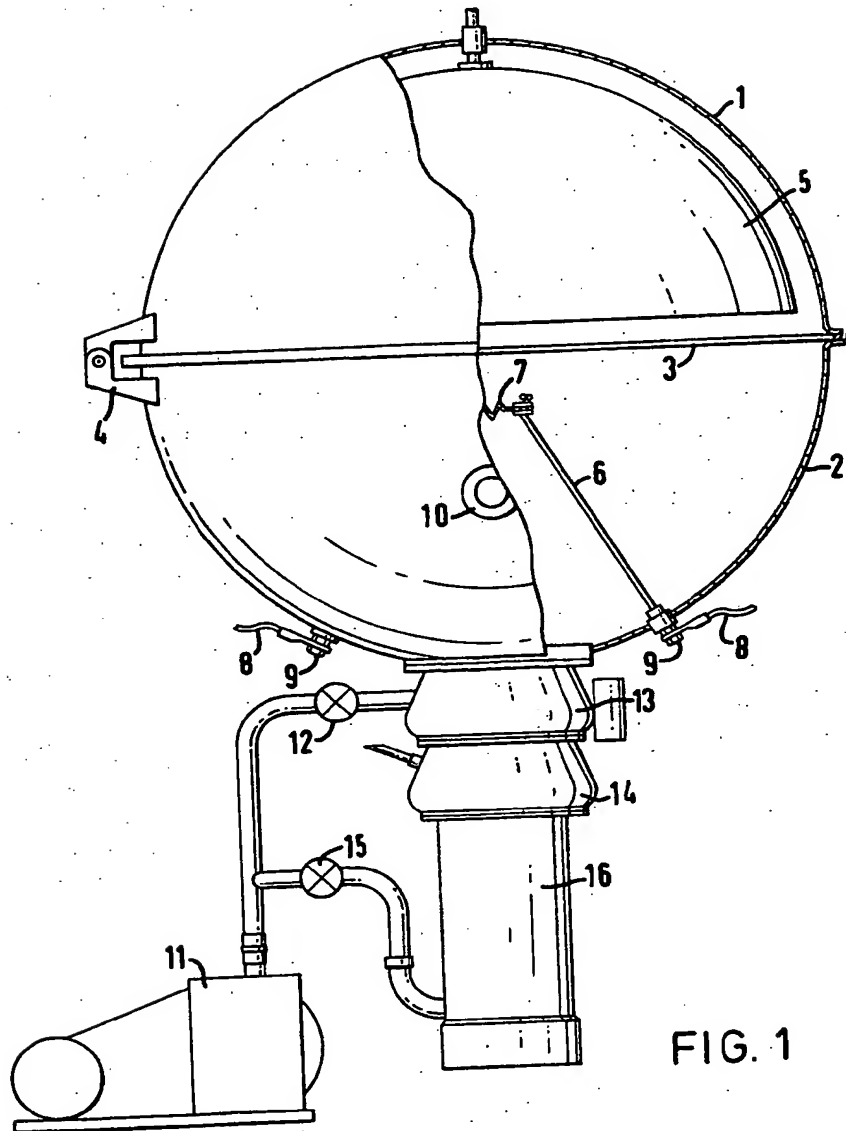


FIG. 1

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COMPLETE SPECIFICATION

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Sheet 2*

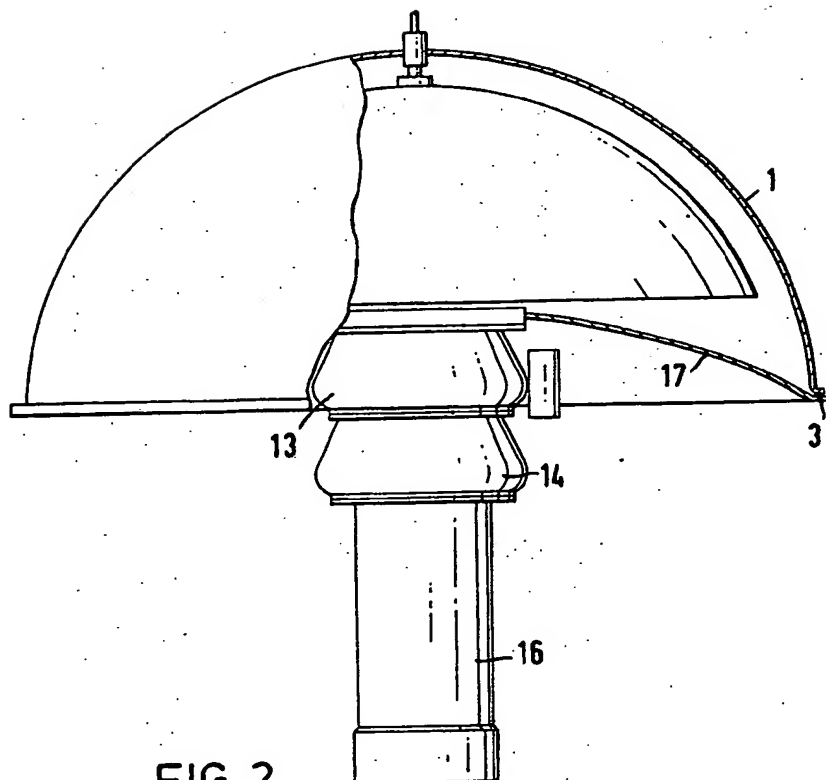


FIG. 2